A Market-Based Adaptive Architecture for Information Survivability

Airfield 1a
Paratroopers 1
Airfield 1b
Bomber Squad 1
Fighter Squad 1
Commander 1
Air Attack
Paratroopers 2
Commander 2
Ground Attack
Airfield 2a
Bomber Squad 2
Airfield 2b
Fighter Squad 2

Dynamic resource allocation:
Hierarchical activities (simplified).
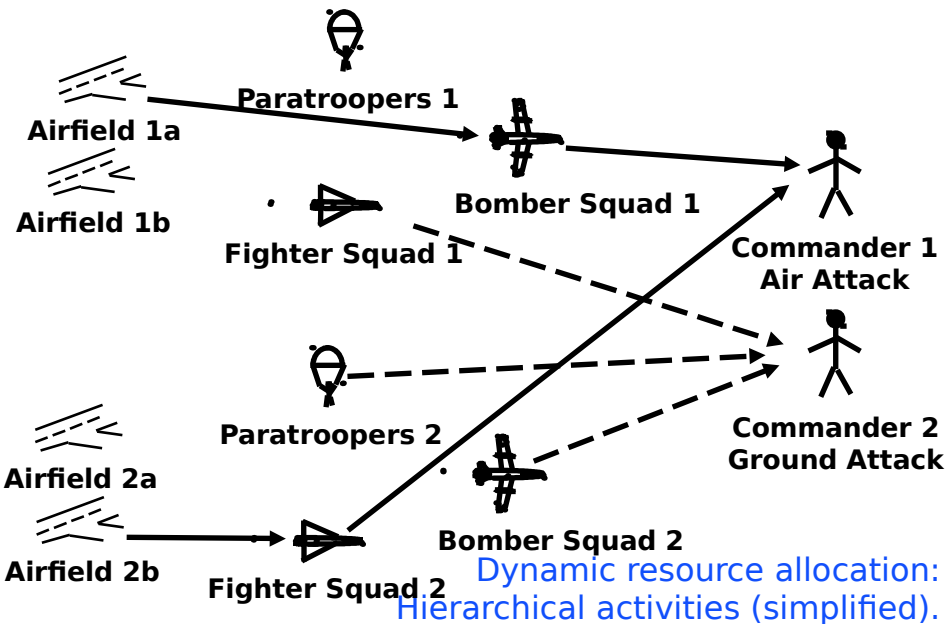
New Ideas

- Market-driven allocation of resources to critical tasks in the face of information-warfare attacks
- Decentralized multilevel model links application and computational services
- General architecture for development of computational market systems
  - **MARX: M**ichigan **A**daptive **R**esource e**X**change
  - Market-aware software agents

Impact

- Distributed system resources allocated to most valuable activities, in normal and degraded environments.
- Military and civilian information infrastructure more robust to *successful* attacks and other disturbances.
- New market-based interfaces to connect distributed information services.
- Methodologies for design and analysis of highly adaptive systems.

Schedule

- Initial MARX deployment
- Agent API release
- Design markets in storage, transport
- Market-based scheduling demo
- Supply chain protocols

- Simulate network resource model, bidding protocols
- Generalized economy specification
- Adaptation scenarios
- Combinatorial markets

- Distributed market management
- Interdependent resource allocation
- Demonstrate adaptive behavior in IW scenario
- Performance evaluation

start

finish

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